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June 10.

SIR Wm. R. HAMILTON, LL. D., President, in the Chair.

Charles Hanlon, Esq., Maxwell M'Master, Esq., Thomas Oldham, Esq., Philip Read, Esq., Henry Roe, Esq., and Robert Wilson, Esq., were elected Members of the Academy.

Dr. Apjohn read an account of the constitution of Jade, and also of two ores of Manganese from the South of Cork.

Dr. Apjohn observed that these minerals had been recently analysed in his laboratory, and as the results were somewhat novel, he thought he might mention them to the Academy; his principal object being that they might appear in the Proceedings, for the information of mineralogists and chemists.

The Jade submitted to analysis was wrought into ornaments of various kinds, which were brought to Europe by Captain Baddeley, who was engaged in several of the operations of the recent Chinese war. Its colour is white, with a tinge of yellowish green. It has a splintery fracture, and is highly translucent. S.G.=2, 965. Hardness over 7, or between rock crystal and topaz. Alone before the blowpipe it glazes, but with great difficulty, on the surface.

By exposure to a strong red heat, it gives off a little water, and becomes opake. Fluxed in the usual manner with carbonate of barytes, it was found to include no alkali. Another portion of it fused with a mixture of the carbonates of potash and soda, yielded the following quantitative results:

	(1)	(2)		(3)
Silex	56.921	1.224		21.10
Alumina and trace of Oxide of Chrome	2.980	0.058		1.00
Lime	14.150	0.496	= 1.572	27.10
Magnesia	22.275	1.076		
Water	1.625	0.180		3.10
Loss	2.049			
	100.000			

From the numbers in columns (2) and (3), which, calculated in the ordinary manner, represent the relative numbers of atoms of the various constituents, it is obvious that the empirical formula of this mineral is

$$21\,\mathrm{Si\,O_3} + \mathrm{Ac_2\,O_3} + 27\left\{\begin{matrix}\mathrm{MgO}\\ \mathrm{CaO}\end{matrix}\right. + 3\,\mathrm{HO}.$$

Now, these atoms may be grouped so as to form a tersilicate of alumina, and a subsesquisilicate of lime and magnesia; so that the following may be considered as the rational formula of Chinese jade:

$$\mathrm{Ac_2\,O_3}, 3\,\mathrm{Si\,O_3} + 9\left(3\left\{\begin{matrix}\mathrm{MgO}\\ \mathrm{CaO}\end{matrix}\right., 2\,\mathrm{Si\,O_3}\right) + 3\,\mathrm{HO}.$$

In looking into works on mineralogy, I find that nephrite or jade has already been at least twice analysed, first, by Saussure, and secondly by Kastner; and, from the account given by Beudant, of the specimen examined by the latter, it would appear to be the Chinese variety. The result, however, obtained by these chemists are quite irreconcileable with each other, and with mine. Thus, Saussure found his specimen to contain 3 per cent. less silex than I have detected in mine, to include no magnesia, but instead thereof, the oxides of iron and manganese, and about 20 per cent. of mixed soda and potash. Kastner obtained 6 per cent. less silex, about 7 per cent. more alumina, and 8 per cent. more magnesia, but no lime. The three specimens, therefore, differ as to the nature and relative proportion of their constituents. I may add, that it is not possible to represent the composition of any two of them by the same formula; so that, admitting the correctness of the published analyses, we are entitled to conclude that minerals really different are, in works upon mineralogy, confounded together under the name of Jade or Neptrite.

Of the ores of mangeneus, the first I shall notice is a specimen of psilomelanane, the black hæmatite of the older mineralogists, which I received some months since from R. W. Townsend, Esq., and which occurs a little to the north of the village of Glandore, in a mixed schistoze and arenaceous rock, which is coloured by Mr. Griffith, as old red sandstone. S. G. = 4.071. Hardness between fluor spar and apalite, occurs massive, but more generally in botryoidal and concretionary forms. The following are its constituents, determined by an analysis very carefully conducted:

			(1)	(2)
Silex			8.592	
Barytes			5.362	0.069
Oxide Copper			1.254	0.031
Red Oxide Mang. (Mn_3O_4)	74.574	= Deutox.	31.241	0.393
Oxygen	7.212	Perox.	50.545	1.152
Water			3.006	0.334

Confining our attention to the oxides of manganese and the water, it is obvious, from the quotients in column (2) that the composition of the ore is very accurately represented by the formula $Mn_2O_3, HO + 3\,Mn\,O_2$, or that it is a compound of one atom of manganite and three of pyrolusite. In the psilomelanite analysed by Turner, there were 4 atoms of sesquioxide to 15 of peroxide; in that analysed by Berthier, 3 of sesquioxide to 17 of peroxide. It is obvious, therefore, that the specimen I have examined is a new variety. But it is also peculiar in other respects. 1. It contains oxide of copper in appreciable quantity, a substance not occurring in the other psilomelanes, though it was found by Professor Davy, of the Dublin Society, to the amount of 4.5 per cent. in a Swedish ore of manganese, which he considered to be a braunite (see Journal of Geol. Society of Dublin, vol. i. part 3.) 2. The amount of barytes included by it is but about one-third of that found in the ores examined by Berthier and Turner.

As respects the manner of the existence of the barytes always found in psilomelane, and in small quantity in some of the other ores of manganese also; I may observe that it is the opinion of some high authorities in science, of M. Beudant, for instance, that *it* and the dentoxide are chemically united, the latter performing the function of an acid. If this idea be correct, it will follow that they are capable of combining in at least two widely different proportions, for the psilomelanes of Berthier and Turner will, upon this view, be represented by the formula $2\,BoO, 3\,Mn_2O_3$, and that which I have analysed by the formula $BoO, 6\,Mn_2O_3$, so that the latter contains, combined with the same quantity of barytes, four times as much sesquioxide of manganese as the former.

This Cork psilomelane is obviously a rich ore of manganese, though of course inferior to the purer forms of pyrolusite. It exists in quantity in the district which I have mentioned, and some cargoes of it have been brought into the Dublin market, but have, I am told, been objected to by the manufacturers of the bleaching salt of lime, in consequence of its excessive hardness, and the consequent difficulty of reducing it to a fine powder.

About three years ago, I received from Captain Kitto, a Cornish miner, long resident in the south of Cork, an ore of manganese, which appeared so different from those with which I was previously acquainted, that I was induced to submit it to analysis. It occurs in the locality already mentioned, at Rowry, a little to the east of Glandore, in lumps of variable size, which, when broken, exhibit, though but ill developed, the faces of crystals belonging apparently to the right prismatic system, mixed, however, here and there with what would appear to be a brown hæmatite. Some of the crystalline portion of the ore, very carefully selected, gave, upon analysis, the following constituents:

			(1)	(2)	
Silex			3.08		
Perox. Iron			34.88	0.436	20
Red Ox. Mangan.	50.67	= Sesquioxide	5.25	0.066	3
Oxygen	6.52	Peroxide	51.94	1.188	54
Water			4.85	0.539	24
			100.00		

These results do not conduct to any very probable formula. But if we suppose that what is set down as sesquioxide is really present as peroxide, a supposition which accords sufficiently well with the analysis, then the composition of this ore becomes very simple, being represented by the formula $Fr_2 O_3$, $HO+3 Mn O_2$, that is by one identical with that which we have found for the psilomelane, when we substitute sesquioxide of iron for the sesquioxide of manganese. I have no doubt that this represents its real constitution, so that it may be safely set down as a new and very distinct species. I may observe that this mineral answers well for yielding oxygen, but is uneconomical as a source of chlorine, in consequence of the wasteful consumption of acid, in order to the saturation of the peroxide of iron; one-half in fact of the acid is uselessly expended.

Mr. William Andrews, Secretary to the Dublin Natural History Society, read a paper upon the genera of Ferns